

CLAIMS

1. A process for producing a high purity polysaccharide containing hydrophobic group, comprising

a first process step of producing an isocyanate group-containing hydrophobic compound, wherein one mole of a hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or of a sterol is reacted with a diisocyanate represented by $\text{OCN-R}^1\text{-NCO}$ in which R^1 is a hydrocarbyl of 1 - 50 carbon atoms and

a second process step of producing the polysaccharide containing hydrophobic group composed of the hydrocarbon group of 12 - 50 carbon atoms or of the steryl group, wherein the isocyanate group-containing hydrophobic compound obtained in the first process step is reacted with one or more polysaccharides,

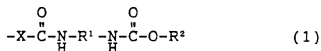
wherein the reaction product in the second process step is purified using a solvent based on ketone.

2. The process as claimed in claim 1, wherein the polysaccharide is selected from the group consisting of pullulan, amylopectin, amylose, dextran, hydroxyethyl cellulose, hydroxyethyl dextran, mannan, levan, inulin, chitin, chitosan, xyloglucan and water-soluble cellulose.

3. The process as claimed in claim 1 or 2, wherein the solvent based on ketone comprises one or more selected from the group consisting of acetone, methyl ethyl ketone, diethyl ketone and diisopropyl ketone.

4. The process as claimed in any one of claims 1 to 3, wherein the hydrophobic group-containing

polysaccharide has a group represented by -XH in which X is oxygen atom or a nitrogen-containing group represented by NY with Y being hydrogen atom or a hydrocarbyl of 1 - 10 carbon atoms wherein 0.1 - 10 -XH groups per 100 monosaccharide units constituting the polysaccharide are replaced by one or more hydrophobic groups represented by the formula (1), namely,



in which X is the same as given above, R¹ denotes a hydrocarbyl having 1 - 50 carbon atoms and R² denotes a hydrocarbon group of 12 - 50 carbon atoms or a steryl group.

5. The process as claimed in claim 4, wherein R² in the formula (1) denotes a steryl group.

6. The process as claimed in any one of claims 1 to 5, wherein the content of the hydrophobic group-containing polysaccharide in the product purified using the solvent based on ketone is as high as 80 % by weight or more.

7. The process as claimed in claim 6, wherein the content of unsubstituted polysaccharide is as low as 20 % by weight or less.

8. The process as claimed in claim 6 or 7, wherein the product has a content of the impurity product, in which both the two NCO groups in the diisocyanate are reacted with the hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or with the sterol, as low as 0.05 % by weight or less.

9. The process as claimed in any one of claims 1 to 8, wherein the product purified using a solvent based on ketone is subjected to a further purification by dispersing the product finely in water under an ultrasonic treatment, with subsequent ultracentrifugal separation.

10. The process as claimed in claim 9, wherein the content of the hydrophobic group-containing polysaccharide in the purified product from the ultracentrifugal separation is as high as 98 % by weight or more.

11. The process as claimed in claim 10, wherein the content of unsubstituted polysaccharide is as low as 2 % by weight or less.

12. The process as claimed in claim 10 or 11, wherein the content of the impurity product, in which both the two NCO groups in the diisocyanate are reacted with the hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or with the sterol, is as low as 0.05 % by weight or less.

13. The process as claimed in any one of claims 1 to 8, wherein the product purified using the solvent based on ketone is further subjected to a purification procedures comprising dissolving the product in an aprotic polar solvent, admixing water to the resulting solution to cause the unsubstituted polysaccharide to be transferred to the aqueous phase and removing the aqueous phase separated by phase separation.

14. The process as claimed in claim 13, wherein the further purification of the product purified using the

solvent based on ketone is performed by dissolving the product in the aprotic polar solvent of an amount of 3 - 50 times the weight of the product and admixing water to the resulting solution in an amount of at least 5 times the weight of the solution.

15. The process as claimed in claim 13 or 14, wherein the aprotic polar solvent comprises one or more selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide and dimethyl sulfoxide.

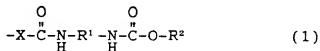
16. The process as claimed in any one of claims 13 to 15, wherein the content of the hydrophobic group-containing polysaccharide in the purified product purified using the aprotic polar solvent is as high as 98 % by weight or more.

17. The process as claimed in claim 16, wherein the content of the unsubstituted polysaccharide is as low as 2 % by weight or less.

18. The process as claimed in claim 16 or 17, wherein the content of the impurity product, in which both the two NCO groups in the diisocyanate are reacted with the hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or with the sterol, is as low as 0.02 % by weight or less.

19. A high purity product of polysaccharide containing hydrophobic group which contains at least 80 % by weight of the polysaccharide containing hydrophobic group, wherein the polysaccharide is one having a group represented by -XH in which X is oxygen atom or a nitrogen-containing group represented by NY with Y being hydrogen atom or a hydrocarbyl of 1 - 10 carbon

atoms wherein 0.1 - 10 -XH groups per 100 monosaccharide units constituting the polysaccharide are replaced by one or more hydrophobic groups represented by the formula (1), namely,



in which X is the same as given above, R¹ denotes a hydrocarbyl having 1 - 50 carbon atoms and R² denotes a hydrocarbon group of 12 - 50 carbon atoms or a steryl group,

the said polysaccharide containing hydrophobic group being obtained by a process comprising

a first process step of producing an isocyanate group-containing hydrophobic compound, wherein one mole of a hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or of a sterol is reacted with a diisocyanate represented by OCN-R¹-NCO in which R¹ is a hydrocarbyl of 1 - 50 carbon atoms,

a second process step of producing the polysaccharide containing hydrophobic group composed of the hydrocarbon group of 12 - 50 carbon atoms or of the steryl group, wherein the isocyanate group-containing hydrophobic compound obtained in the first process step is reacted with one or more polysaccharide, and

purifying the reaction product from the second process step using a solvent based on ketone.

20. The high purity product of polysaccharide containing hydrophobic group as claimed in claim 19, wherein the polysaccharide is selected from the group

consisting of pullulan, amylopectin, amylose, dextran, hydroxyethyl cellulose, hydroxyethyl dextran, mannan, levan, inulin, chitin, chitosan, xyloglucan and water-soluble cellulose.

21. The high purity product of polysaccharide containing hydrophobic group as claimed in claim 19 or 20, wherein R^2 in the formula (1) is steryl.

22. The high purity product of polysaccharide containing hydrophobic group as claimed in any one of claims 19 to 21, wherein the content of unsubstituted polysaccharide is as low as 20 % by weight or less.

23. The high purity product of polysaccharide containing hydrophobic group as claimed in any one of claims 19 to 22, wherein the content of the impurity product, in which both the two NCO groups in the diisocyanate are reacted with the hydroxyl group-containing hydrocarbon having 12 - 50 carbon atoms or with the sterol, is as low as 0.05 % by weight or less.

24. The high purity product of polysaccharide containing hydrophobic group as claimed in any one of claims 19 to 23, wherein the product purified using the solvent based on ketone is subjected to a further purification by dispersing the product finly in water under an ultrasonic treatment, with subsequent ultracentrifugal separation.

25. The high purity product of polysaccharide containing hydrophobic group as claimed in any one of claims 19 to 23, obtained by subjecting the product purified using the solvent based on ketone to a further

purification procedures comprising dissolving the product in an aprotic polar solvent, admixing water to the resulting solution to cause the unsubstituted polysaccharide to be transferred to the aqueous phase and removing the aqueous phase separated by phase separation.